

TIMEPIECE WITH TWO ROTATING BEZELS

FIELD OF THE INVENTION

The present invention concerns a timepiece, and more particularly a wristwatch comprising two rotating bezels each having substantially the same non-circular or non-symmetrical contour in relation to the centre of the dial.

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BACKGROUND OF THE INVENTION

Timepieces provided with two rotating bezels, arranged in accordance with three different embodiments are already known.

In CH Patent No. 308 601, the watch comprises a device formed of two
10 external bezels in the form of juxtaposed rings, respectively bearing the hour and minute symbols, allowing an interval of time to be measured with said watch. The watch disclosed in FR Patent No 2, 192 331 also comprises two superposed concentric external rotating bezels. The top bezel, which can be manipulated in rotation by means of a lateral knurled member, comprises only one aperture able to
15 be positioned facing a determined time indication. The bottom bezel can be manipulated in rotation by means of a top knurled member to bring one of the indications that it carries opposite the aperture and to let the user know of the imminence of a given event. As can be seen in the two aforecited documents, manoeuvring the bezels only enables the information displays to be altered without
20 any significant influence on the overall external appearance of the watch.

According to a second embodiment, illustrated by example by US Patent No. 3 548 588, the device comprises an external bezel and an internal bezel, visible through the glass and able to be manipulated by the crown, for displaying various information on their periphery, but evidently both being circular, without any possibility
25 of superposition.

According to a third embodiment, illustrated by US Patent No. 3 665 701, the two rotating bezels are located inside the watch case underneath the glass, in a substantially symmetrical configuration to that disclosed in CH Patent No. 308 601 and are driven in rotation by manipulations carried out on the crown.

30 As can be seen, these three embodiments enable information to be displayed in relation to the passing of time, but manipulating the bezels does not substantially alter the external appearance of the watch

SUMMARY OF THE INVENTION

The invention thus concerns an embodiment that differs from those previously described in that the relative rotation of one rotating bezel with respect to the other, whether it is carried out manually or automatically, alters the visual appearance of the watch, said rotation also being possibly associated, in a passive or active manner, with the passing of time.

The invention therefore concerns a timepiece, which will be essentially illustrated hereinafter by a wristwatch comprising a case formed of a back cover and a middle part closed by a glass arranged above a dial with an analogue or digital display, delimiting the housing of a watch movement, said glass being surrounded by two rotating external upper and lower bezels, superposed on a shoulder of the middle part. The wristwatch is characterised in that the two bezels and the shoulder, on which they can be manoeuvred in rotation, have identical or similar contours that are non-circular or non-symmetrical in relation to the centre of the dial in the superposed position. Thus, the bezels can occupy a first rest position in which they are essentially superposed above the shoulder of the middle part and a second position in which concealed parts of the shoulder and/or concealed parts of the lower bezel are made visible after rotating at least one bezel.

Within the scope of the present description, "similar contour" means that the contour of one element, the shoulder or the bezel, can comprise an enlarging strip leaving said strip apparent in the rest position, while concealing other surfaces of said element.

In a preferred embodiment, the shoulder and the bezels have a curved oblong shape, for example an oval shape. The bezels can be rotated manually, possibly with the bezels driving each other, or automatically by means of mechanical driving that can be programmed from the movement. As a function of their angle of rotation from the rest position, they can also activate/deactivate a function integrated in the timepiece in conjunction with or independent of the passing of time, such as activating an alarm time or passage into a display mode that is not linked to the passing of time.

As can be seen, in such a timepiece, the particular design of the rotating bezels allows the external appearance of the watch to be altered by revealing decorations that are normally hidden in the rest position, such as inlaid jewellery, and can allow interaction with the watch movement.

SHORT DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will appear upon reading the description of various embodiments given by way of illustrative and non-

limiting example with reference to the annexed drawings, in which:

- Figure 1 is a top view of a first embodiment;
- Figure 2 is a cross-section along the line II-II of Figure 1;
- 5 - Figure 3 is a half-view from above showing the concealed parts along the arrow III of Figure II;
- Figures 4 to 7 show the various spreading steps of the rotating bezels of Figure 1;
- Figures 8 and 9 show a second embodiment when the rotating bezels are respectively in the rest position and spread out position?;
- 10 - Figures 10 and 11 show a third embodiment when the rotating bezels are respectively in the rest position and spread out position;
- Figure 12 is a top view of a fourth embodiment, and
- Figures 13A and 13B show a cross-section along the line XIII-XIII of Figure 8.

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DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a top view of a timepiece according to the invention, illustrated by a wristwatch, in the "rest" position, also shown in Figure 2 in a cross-section II – II passing through the 9 o'clock and 12 o'clock positions. The watch comprises a case 1
20 formed of a back cover 3 and a middle part 2 closed by a glass 4 arranged above a dial 5 with an analogue display delimiting the housing of a watch movement 6 provided with an external control member 7, such as a crown-push-button. In the example shown, glass 4 and dial 5 have a circular shape, but the external contour 2a of middle part 2 of the wristwatch is oval, i.e. with two axes of symmetry at 12 o'clock
25 – 6 o'clock and 3 o'clock – 9 o'clock, but without symmetry of rotation.

Glass 4 is surrounded by a top rotating bezel 10 and a bottom rotating bezel 20, the two bezels 10, 20 having an oval shape and being superposed above a shoulder 8 of middle part 2. Shoulder 8 is formed of a ring 8a, parallel to the surface of the dial, and two rounded parts 8b inclined towards back cover 3 and defining the
30 oval shape.

In the rest position shown in Figures 1 and 2, the base of the bottom bezel 20 totally covers the inclined parts 8b and partially covers ring 8a of shoulder 8. The top surface of bottom bezel 20 is parallel to the inclined parts 8b and extends above the zone 8a covered by said bottom bezel 20, the connection between the base and the
35 top part forming an inclined plane 21 permanently visible over the entire periphery of the wristwatch. It will be observed that this design of the bezel has a cork-like shape
27 whose narrowest part is at the break between parts 8a, 8b of shoulder 8.

The base of top bezel 10 comprises a part abutting over the entire top surface of bottom bezel 20, said abutting part being extended by a foot 13 extending as far as ring 8a of shoulder 8 in the space delimited by the vertical wall 2b of middle part 2 joining ring 8a of shoulder 8 and the inner vertical wall of bottom bezel 20.

5 The visible face of top bezel 10 comprises an inclined surface 12 parallel to the base of said bezel and a connection 11 to said base, inclined and substantially parallel to connection 21 of bottom bezel 20.

 The two bezels 10, 20 were designed to allow very simple assembly. After having positioned bottom bezel 20 on the outer part of shoulder 8a, foot 13 of top
10 bezel 10 is snap fitted into wall 2b of middle part 2, snap fit means 19 being schematically represented by an annular spring. Cork 27 improves the holding and positioning of bottom bezel 20.

 With reference now to Figures 4 to 7, the different aspects of the wristwatch are shown when bezels 10, 20 are rotated from the rest position shown in Figure 1,
15 i.e. when said bezels are superposed. In Figure 4, top bezel 10 starts to rotate in the anti-clockwise direction revealing portions of concealed parts 23 of bottom bezel 20 which has remained in its initial position. In Figure 5, the two bezels 10, 20 have a symmetrical position in a cross. It will be observed that this configuration already constitutes a decorative design as such. In other words, a single rotating bezel having
20 the asymmetrical features listed at the beginning can already attain one of the objects of the invention.

 In Figure 6, top bezel 10 continues to rotate, driving bottom bezel 20 through the same angle of rotation and causing portions of concealed parts 9 of shoulder 8 to appear. In Figure 7 the two bezels have been brought into symmetrical positions,
25 which, in this example, correspond to a rotation of top bezel 10 through 135° and of bottom bezel 20 through 45° in the anti-clockwise direction, although other choices are possible, for example with rotations of 120° and 60° .

 In order to facilitate the symmetrical positioning of bezels 10, 20, it is advantageous to provide hollow cams for controlling the angular clearance of each
30 bezel, as explained hereinafter with reference to Figures 2 and 3. A first circular hollow cam 14 is formed in the external vertical wall of foot 13 of top bezel 10 with an angular aperture α in the clockwise direction, said cam 14 cooperating with a stop member 24 of the vertical wall opposite bottom bezel 20. A second circular hollow cam 15 is formed in ring 8a of shoulder 8 with an angular aperture β in the anti-clockwise
35 direction, said second cam 15 cooperating with a stop member 25 formed at the base of bottom bezel 20 in the part covering ring 8a. In the example shown in Figures 1 and 4 to 7, $\alpha = 90^\circ$ and $\beta = 45^\circ$. Thus, when top bezel 10 rotates through 90° in the anti-

clockwise direction, stop member 24 follows cam 14 to the position shown in Figure 5, without moving bottom bezel 20. While continuing to rotate top bezel 10, lateral stop member 24 then drives bottom bezel 20 until lower stop member 25 abuts the end of cam 15 to immobilise the two bezels in the position shown in Figure 7. It is of course possible to choose other angular apertures, for example $\alpha = \beta = 60^\circ$, to have perfect symmetry after total rotation. Instead of having cams 14 and 15 arranged on either side of the 3 o'clock position, it is of course possible to arrange them at any other location on the vertical wall of foot 13 and ring 8a of shoulder 8. Likewise, it is possible to invert the stop members and cams on opposite walls, for example to arrange cam 14 in bottom bezel 20 and stop member 24 on top bezel 10.

In the embodiment that has just been described, top bezel 10 and bottom bezel 20 have oblique extensions 11, 21 facilitating the manipulation thereof, whether or not there are guide cams 14, 15 limiting the clearance of bezels 10, 20.

In other embodiments, shown in Figures 8, 9 and 10, 11, the two bezels are totally superposed.

Figure 8 shows a second embodiment which differs from that previously described in that the two superposed bezels 10, 20 are perfectly circular, but have a centre C' shifted in relation to centre C of the dial. As can be seen in Figure 9, by rotating bezels 10, 20, one can alter the external appearance of the wristwatch. Referring also to Figure 13B, it can be seen that a knurling 26 on top bezel 10 and a lateral knurling 28 on bottom bezel 20 can facilitate manipulation of the bezels. Figure 13B also shows schematically a contactor 17, for example a pressure contactor or a magnetic contactor, for activating a function of the wristwatch by rotating bottom bezel 20 through an angle greater than that of a groove 17a. Conversely, the cross-section of Figure 13A shows another embodiment in which foot 13 of top bezel 10 is provided with a toothed sector 16 for driving said bezel in rotation by means of a toothed wheel 18, the rotation of which can be controlled or programmed by means of external control member 7. If the two bezels 10, 20 are provided with cams as previously described, bottom bezel 20 will also be driven. It is for example possible to programme a determined time at which the two bezels will go into the position corresponding to that shown in Figure 7.

Referring now to Figures 10 and 11, there is shown a wristwatch watch with a digital liquid crystal display, provided with two push-buttons 7a, 7b and comprising two rotating bezels 10, 20 superposed in the rest position and of totally asymmetrical shape. As can be seen in Figure 11, the appearance of the wristwatch is totally altered after rotating bezels 10, 20.

Figure 12 shows yet another embodiment that differs from that shown in Figure 1 in that the concealed parts 9 of shoulder 8 have extensions 29 that are permanently visible in the rest position producing an additional aesthetic effect.